

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference M04-F-420CT1	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/JP2004/019291	International filing date (<i>day/month/year</i>) 16/12/2004	(Earliest) Priority Date (<i>day/month/year</i>) 18/12/2003
Applicant MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box II).

3. **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

- b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP2004/019291

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11C13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 204 139 B1 (LIU SHANGQING ET AL) 20 March 2001 (2001-03-20) figures 4a,4b -----	1-4
Y	US 6 473 332 B1 (IGNATIEV ALEX ET AL) 29 October 2002 (2002-10-29) figures 2,5-7 column 4, line 9 - line 13 -----	9,11
X	LIU S Q ET AL: "Electric-pulse-induced reversible resistance change effect in magnetoresistive films" 8 May 2000 (2000-05-08), APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, PAGE(S) 2749-2751 , XP012025238 ISSN: 0003-6951 figure 1 -----	1,5-8
X	----- -/-	1-4

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

8 April 2005

Date of mailing of the international search report

22/04/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Havard, C

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP2004/019291

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/003674 A1 (HSU SHENG TENG ET AL) 2 January 2003 (2003-01-02)	1
Y	figures 1,3 paragraph '0014! - paragraph '0015! paragraph '0025! - paragraph '0028! -----	9,11
P,X	ROZENBERG M J ET AL: "Nonvolatile memory with multilevel switching: A basic model" PHYS REV LETT; PHYSICAL REVIEW LETTERS APR 30 2004, vol. 92, no. 17, 30 April 2004 (2004-04-30), pages 178302-1-178302-4, XP002323764 pages 178302-2, column 2 figure 2 -----	1
P,X	EP 1 418 592 A (SHARP KABUSHIKI KAISHA) 12 May 2004 (2004-05-12) figure 1 -----	1,5-8
2		

INTERNATIONAL SEARCH REPORT

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4,9-11

Initializing of a variable-resistance

2. claims: 5-8

Variable-resistance connected to a fixed resistor used during read

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP2004/019291

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 6204139	B1	20-03-2001	WO	0015882 A2		23-03-2000
US 6473332	B1	29-10-2002	NONE			
US 2003003674	A1	02-01-2003	JP TW US US US US US US US US	2003068984 A 571348 B 2003142578 A1 2003206481 A1 2004108528 A1 2003203585 A1 2004170048 A1 2003003675 A1 2005052942 A1 2005054138 A1		07-03-2003 11-01-2004 31-07-2003 06-11-2003 10-06-2004 30-10-2003 02-09-2004 02-01-2003 10-03-2005 10-03-2005
EP 1418592	A	12-05-2004	JP CN EP US	2004158143 A 1499526 A 1418592 A1 2004130938 A1		03-06-2004 26-05-2004 12-05-2004 08-07-2004

INTERNATIONAL SEARCH REPORT

Intern I Application No
PCT/JP2004/019291

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11C13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G11C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 204 139 B1 (LIU SHANGQING ET AL) 20 March 2001 (2001-03-20) figures 4a,4b	1-4
Y	-----	9,11
X	US 6 473 332 B1 (IGNATIEV ALEX ET AL) 29 October 2002 (2002-10-29) figures 2,5-7 column 4, line 9 - line 13	1,5-8
X	LIU S Q ET AL: "Electric-pulse-induced reversible resistance change effect in magnetoresistive films" 8 May 2000 (2000-05-08), APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, PAGE(S) 2749-2751 , XP012025238 ISSN: 0003-6951 figure 1	1-4
	----- -/-	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

8 April 2005

Date of mailing of the international search report

22/04/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Havard, C

INTERNATIONAL SEARCH REPORT

Intern al Application No
PCT/JP2004/019291

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/003674 A1 (HSU SHENG TENG ET AL) 2 January 2003 (2003-01-02) figures 1,3 paragraph '0014! - paragraph '0015! paragraph '0025! - paragraph '0028!	1
Y		9,11
P, X	ROZENBERG M J ET AL: "Nonvolatile memory with multilevel switching: A basic model" PHYS REV LETT; PHYSICAL REVIEW LETTERS APR 30 2004, vol. 92, no. 17, 30 April 2004 (2004-04-30), pages 178302-1-178302-4, XP002323764 pages 178302-2, column 2 figure 2	1
P, X	EP 1 418 592 A (SHARP KABUSHIKI KAISHA) 12 May 2004 (2004-05-12) figure 1	1,5-8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/019291

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4,9-11

Initializing of a variable-resistance

2. claims: 5-8

Variable-resistance connected to a fixed resistor used during read

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter	Application No
PCT/JP2004/019291	

Patent document cited in search report	Publication date	Patent family member(s)			Publication date
US 6204139	B1	20-03-2001	WO	0015882 A2	23-03-2000
US 6473332	B1	29-10-2002	NONE		
US 2003003674	A1	02-01-2003	JP	2003068984 A	07-03-2003
			TW	571348 B	11-01-2004
			US	2003142578 A1	31-07-2003
			US	2003206481 A1	06-11-2003
			US	2004108528 A1	10-06-2004
			US	2003203585 A1	30-10-2003
			US	2004170048 A1	02-09-2004
			US	2003003675 A1	02-01-2003
			US	2005052942 A1	10-03-2005
			US	2005054138 A1	10-03-2005
EP 1418592	A	12-05-2004	JP	2004158143 A	03-06-2004
			CN	1499526 A	26-05-2004
			EP	1418592 A1	12-05-2004
			US	2004130938 A1	08-07-2004